

PROCUREMENT MANAGEMENT FOR SENSOR INSTALLATION UNDER RUNWAYS



2014 FAA WORLDWIDE AIRPORT TECHNOLOGY TRANSFER CONFERENCE

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Overview

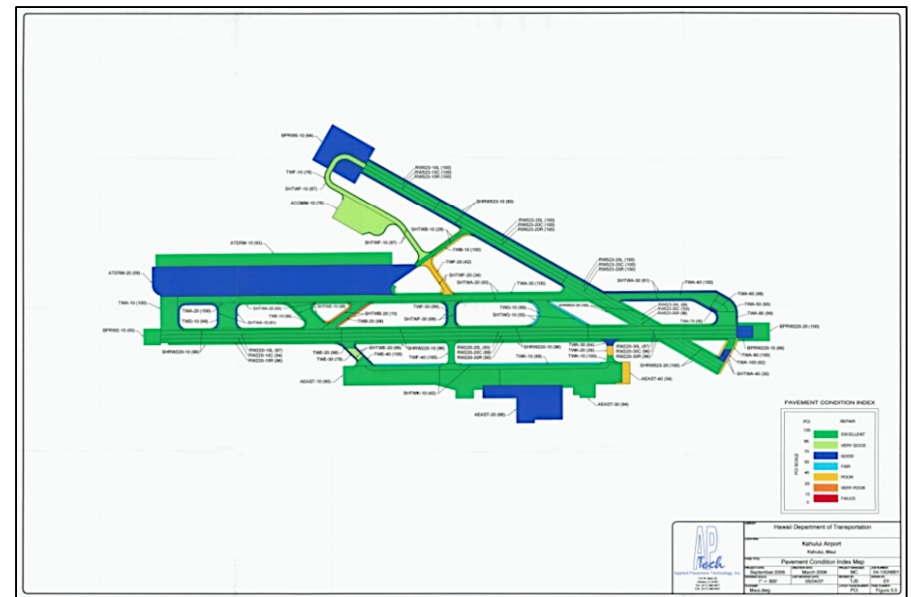


- Background
- Proposed Instrumentation Layout
- Installation Procedures and Schedule
- Safety Regulations and Approvals
- Project Future
- Conclusion

BACKGROUND

Purpose of Instrumentation Installation in Hawaii

- First installation of its kind in tropical climate conditions.
- Reduce runway downtime.
- Supplement existing pavement test data.



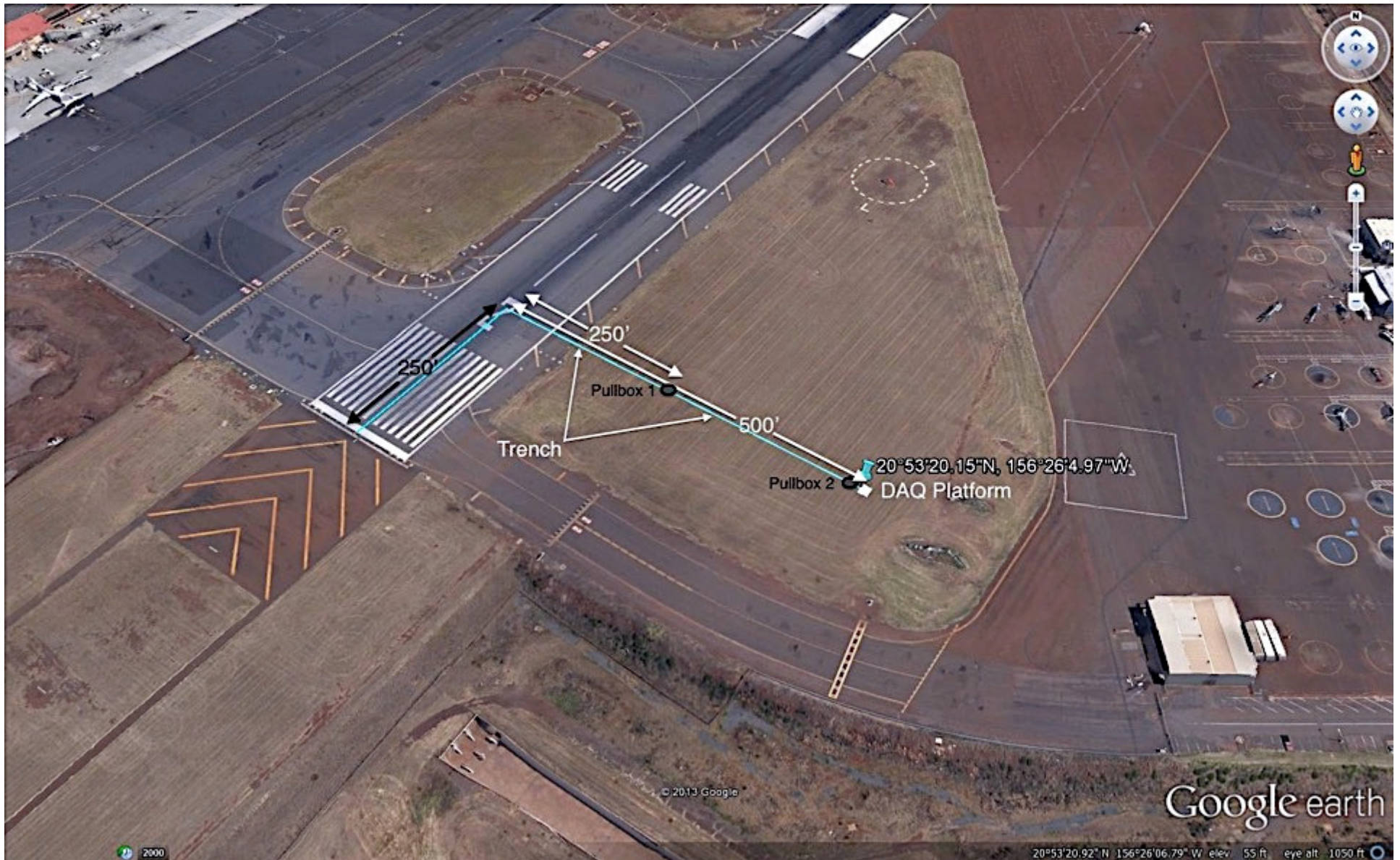
Kahului Airport

Kahului Airport Construction Notes

- Limited Night Hours
 - All work must be completed at night during regular runway closure hours
 - *Just 2 hours for sensor installation during repaving:*
 - Cannot rely on typical installation methods
- County ordained closure windows
 - Main paving contractor allotted restricted construction dates – flexibility is key!

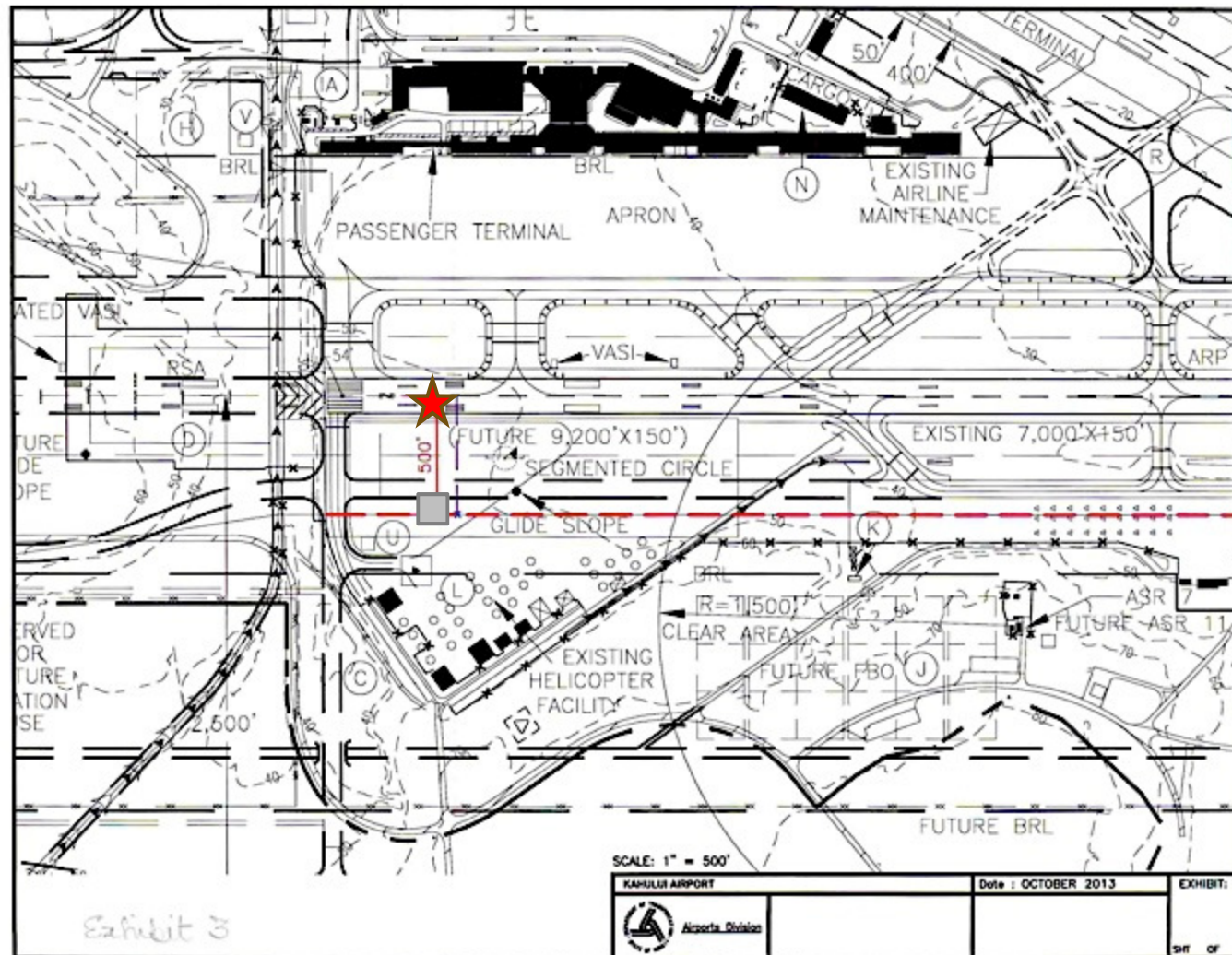
PROPOSED INSTRUMENTATION LAYOUT

Proposed Project Layout

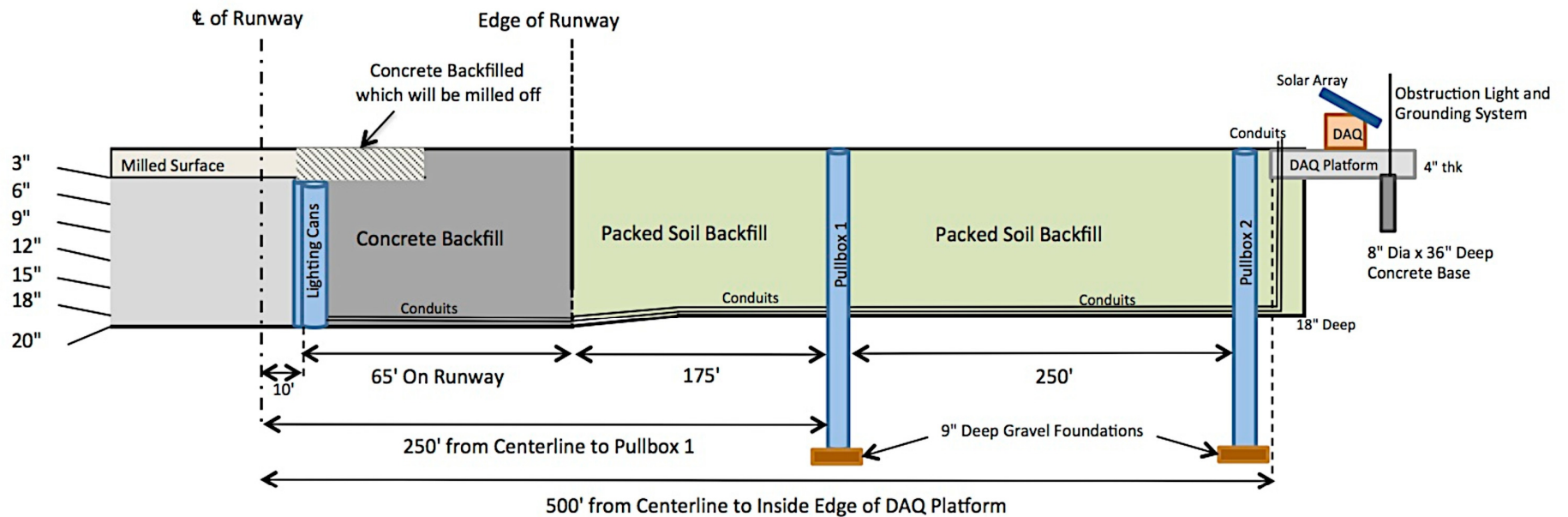


Sensor and DAQ Location on Runway

- ★ Sensors
- DAQ



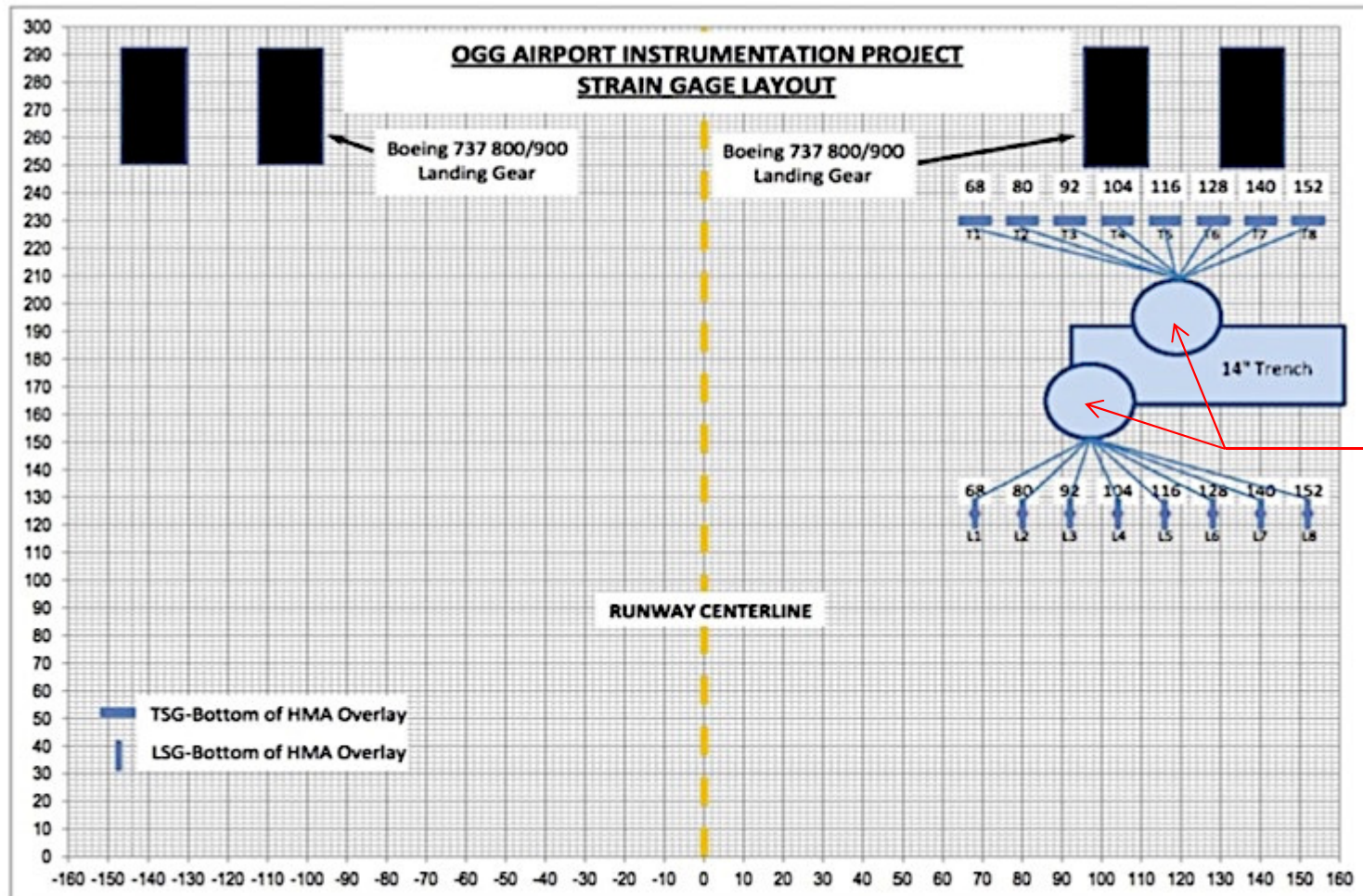
Trench Cross Section Diagram



Notes:

Trench width = 6"
 Light can is 16" deep, extends 20" below runway surface
 Light can begins 1" below milled surface height, 4" below ground surface
 Precast pullboxes have an interior height of 2' and are 4' 9" deep

Proposed Sensor Layout



INSTALLATION PROCEDURES AND SCHEDULE

3 Phases of Installation



- Off-Runway Installations
 - ▣ DAQ Platform
 - ▣ 2 Pullboxes
 - ▣ Off-Runway Trench
- On-Runway Installations
 - ▣ Lighting Cans
 - ▣ On-Runway Trench
 - ▣ Pulling Wires
- Sensor Installation

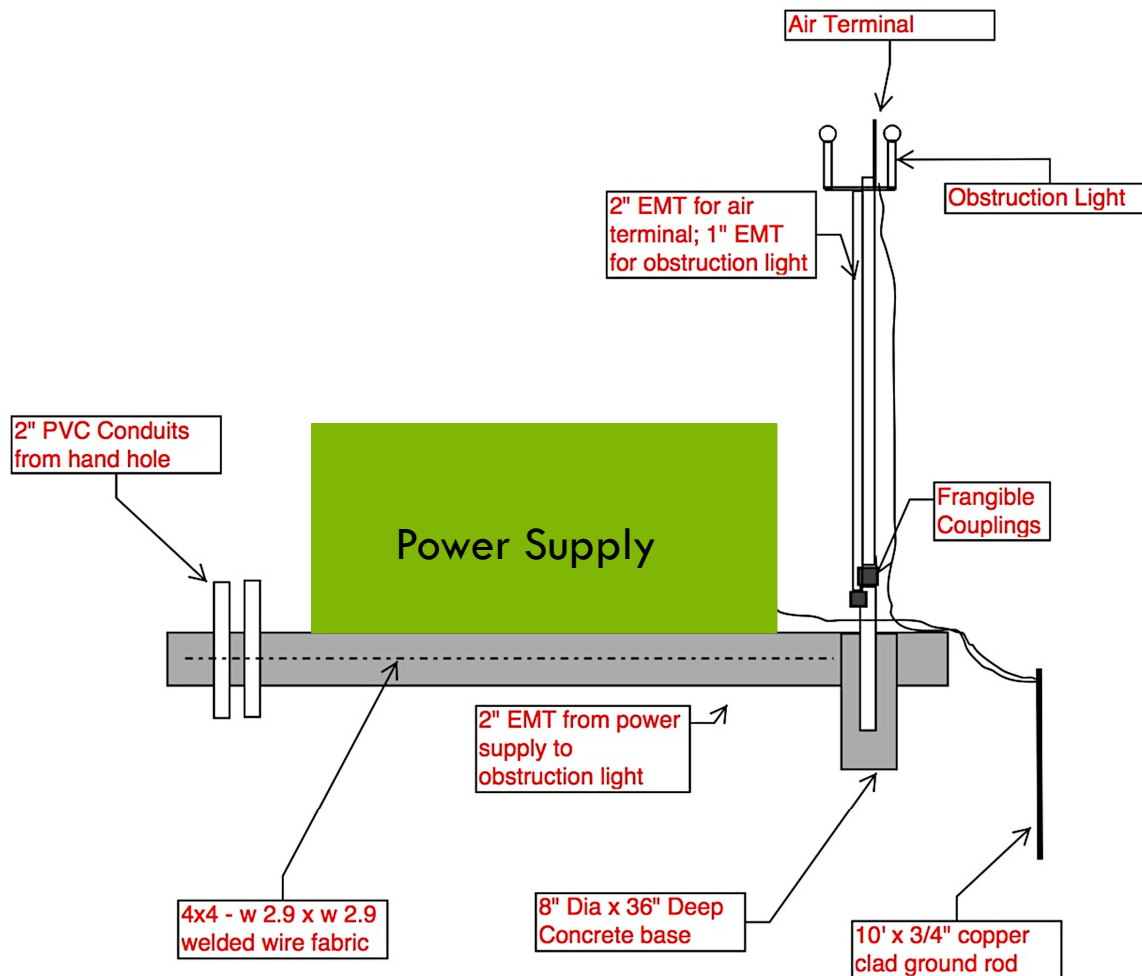
Data Acquisition Center and Slab



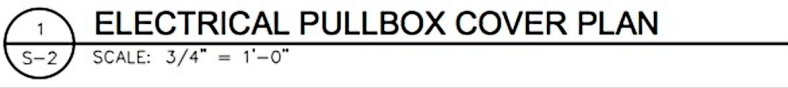
Photo courtesy of FAA NAPTF.

- The DAQ system is installed on a concrete platform 500' from the runway centerline.
- Any farther: risk losing signals.
- Airport prohibits structures within 500'.

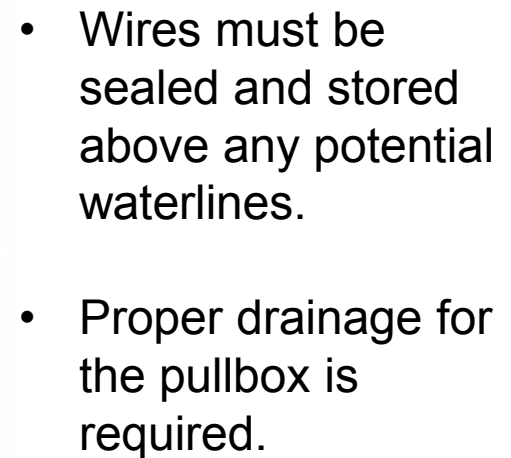
DAQ Slab Specifications



- Obstruction light and lightning protection system must be installed.



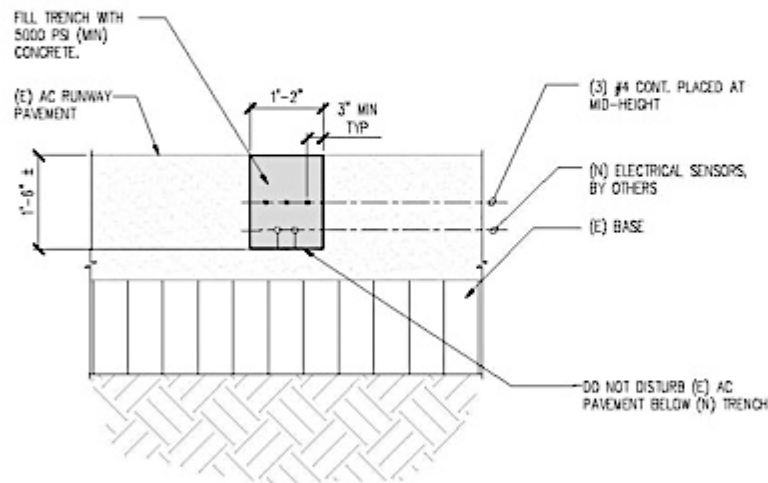
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Trenching, Backfill, and Conduits

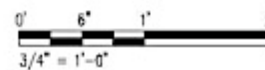
NOTES:

1. AN ACCELERATING ADMIXTURE IS ACCEPTABLE TO USE IN THE TRENCH CONCRETE MIX DESIGN. TRENCH MIX DESIGN SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
2. CONCRETE SHALL HAVE A 1 DAY COMPRESSIVE STRENGTH OF 5,000 PSI.



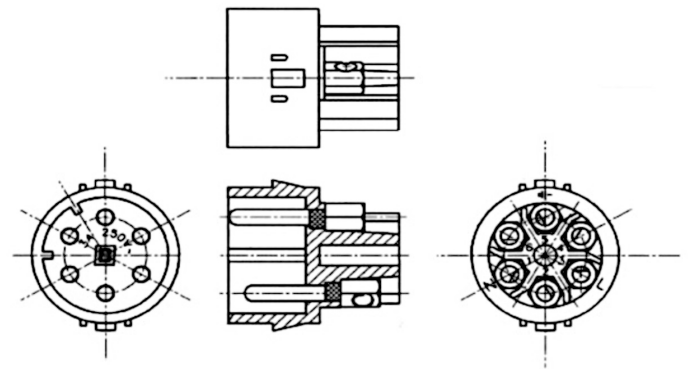
4 CONDUIT TRENCH DETAIL
S-2 SCALE: 3/4" = 1'-0"

GRAPHIC SCALE



- Backfill of on-runway trench must be high early strength concrete and painted black to match tarmac color.
- Conduits must be at least 20" deep on-runway and 18" deep elsewhere.

Connector Attachments



SA3243 **BULGIN**

CONNECTOR DIAGRAM

- Connectors are installed on both ends of the sensor wires according to FAA directed pin plans.
- Allows for fast connection on sensor installation night.

Sensor Installation



Photos courtesy of FAA NAPTF.

Sensor Installation Activities (2 hours):

Runway surface is milled off.

1. Surveyor locates lighting cans on milled surface.
2. Remaining 1" of concrete chipped off the top of lighting cans.
3. FAA lays out and installs sensors.
4. Asphalt binder is applied to lock in sensors. Asphalt to be supplied through coordination with paving contractor.

Runway surface is repaved.

SERVICES AND MATERIAL PROCUREMENT

Material Ordering



- Long lead times on essential parts:
 - Gauge and Thermocouple wires (6-8 weeks)
 - Custom lengths required

- Potting compound epoxy for connectors a hazardous material
 - Only able to be shipped to Hawaii via UPS Red

Cutting, Coring, and Backfill



- Limited Contractors
 - One road repair company on Maui: \$\$\$
 - Early set concrete PSI inadequate at other
- Trenching Wheel
 - Located on Oahu, not able to rent
 - Alternative: saw cutting and manual excavation.

SAFETY REGULATIONS AND APPROVALS

Rules and Regulations



- FAA 7460 Form for DAQ Platform
 - Long approval process

- CSPP
 - Contractor Safety Plan
 - Multiple iterations typically required

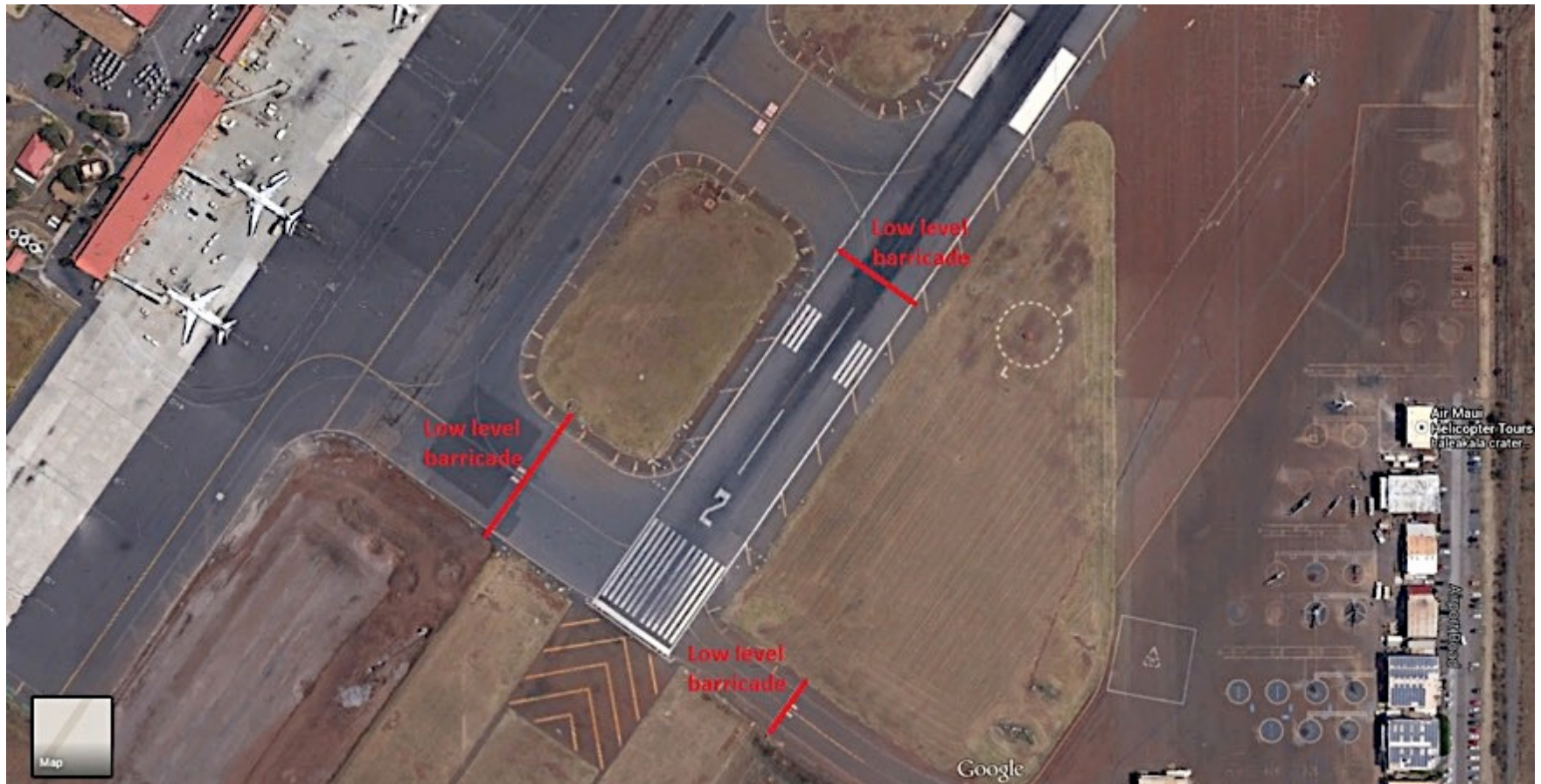
- SMA Restrictions
 - Leverage for Maui residents and attorneys
 - Special Management Area

Safety Procedures



- ❑ Badging and Movement Area Training
- ❑ Low-profile barricades
- ❑ Designated hauling routes
- ❑ Beacons and safety flags for equipment
- ❑ Lighted “X” signs for runway
- ❑ Spill kit and FOD cleanup plan
- ❑ Safety meetings before every night of work

Kahului Barricade Plan



PROJECT FUTURE

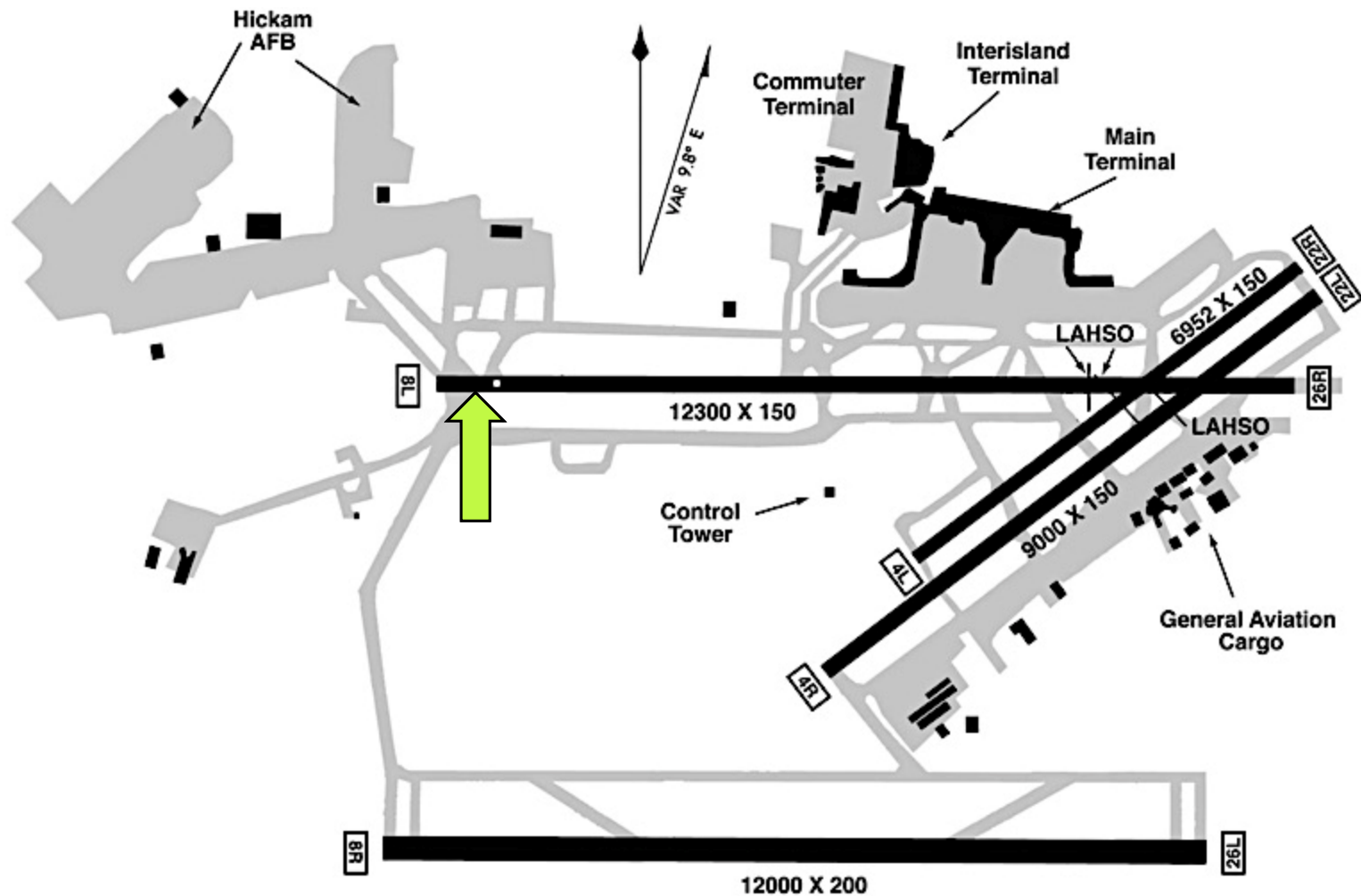
Moving Forward

- ***Kahului Cancelled:***

- Not permitted to work within main contractor's allotted days or add to construction window.

- Project materials and methods will be used at ***Honolulu International Airport***, Runway 8L, and will be coordinated by HDOT-A in 2015.

Honolulu (HNL) Runway 8L



Thank you!